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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,400	04/06/2001	Steven P. Poulsen	11983.0078	5178

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EXAMINER

WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
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2655

DATE MAILED: 11/17/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/828,400

Applicant(s)

POULSEN ET AL.

Examiner

James S. Wozniak

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. In response to the office action from 11/24/2003, the applicant has submitted an amendment, filed 2/24/2004, amending the drawings and Claims 1, 12, and 20, while arguing to traverse the art rejection based on the limitations regarding determination of a number of transform products above a threshold and further comparing that number to a validation range to determine if a frame contains a signal component (*Amendment, Pages 10-11*). Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new grounds of rejection in view of Nakatoh et al (*U.S. Patent: 5,611,019*).

2. Based on the amendments and arguments in regards to the drawings and specification, the examiner has withdrawn the previous objections directed towards minor informalities.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-4, 6, 8, 9, 12, 13, 15-17, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatoh et al (*U.S. Patent: 5,611,019*) in view of Jankowski (*U.S. Patent: 4,052,568*).

With respect to **Claim 1**, Nakatoh discloses:

Accumulating samples of the composite signal to provide a series of frames each containing a plurality of signal samples (*receiving input signal frames, Col. 11, Lines 10-29*);

Transforming each frame to provide transform products in the frames (*parameters obtained from an FFT, Col. 11, Lines 30-45*);

Analyzing each frame to determine a number of transform products having an amplitude above a threshold (*threshold comparison, Col. 15, Lines 3-10*);

For each frame comparing the number of transform products to a validation range to determine if the frame contains the signal component (*counting a number of speech segments and comparing that number to a threshold for speech detection, Col. 15, Lines 11-23, and Fig. 4*).

While Nakatoh discloses a method similar to the present invention, frames are counted to determine to detect speech over a particular audio segment, however it would have been obvious to one of ordinary skill in the art at the time of invention to perform a similar method using individual speech samples to detect the presence of speech for a particular frame as is evidenced by Jankowski. Jankowski discloses a method of voice activity detection that counts a specific number of samples higher than a threshold to determine the presence of speech (*Col. 3, Line 59-Col. 4, Line 24*).

Nakatoth and Jankowski are analogous art because they are from a similar field of endeavor in the detection of speech in the presence of noise. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Nakatoth with the means of detecting the presence of speech based on counting samples as taught by Jankowski to implement a more adaptive voice activity detection method by counting samples to detect the presence of noise for an audio segment (frame) to account for rapid changes in signal level from since the initial threshold comparison is performed over a shorter segment.

With respect to **Claim 2**, Nakatoth recites:

Determining if the signal component is present in the composite signal based on the contents of a series of the individual frames (*Col. 15, Lines 3-23*).

With respect to **Claim 3**, Nakatoth discloses:

Detecting the presence of a predetermined characteristic in the composite signal before the operation of determining the presence of the signal component can be performed (*power above a predetermined threshold, Col. 15, Lines 3-23*).

With respect to **Claim 4**, Nakatoth discloses:

Transforming each frame is performed by a Fast Fourier Transform (*Col. 11, Lines 30-45*).

With respect to **Claim 6**, Nakatoth recites:

Transforming each frame is performed by a windowed transforming (*Col. 11, Lines 46-54*).

With respect to **Claim 8**, Nakatoth teaching the frame counting method for determining the presence of speech, as applied to claim 1, while Jankowski teaches counting until a

predetermined number (3) of speech frames is detected to indicate the presence of speech as applied to claim 1.

With respect to **Claim 9**, Nakatoh shows:

The signal component is voice in a composite signal containing voice and non-voice components (*Fig. 4, Elements 370 and 380*).

Claim 12 contains subject matter similar to Claim 1, and thus, is rejected for the same reasons.

With respect to **Claim 13**, Nakatoh recites:

A component to determine if the signal component is present in the composite signal based on the contents of the individual frames (*Col. 15, Lines 3-23*).

Claim 15 contains subject matter similar to Claim 6, and thus, is rejected for the same reasons.

With respect to **Claim 16**, Nakatoh discloses:

Detecting the presence of a predetermined characteristic in the composite signal before operation of the frame validation component can be completed (*power above a predetermined threshold, Col. 15, Lines 3-23*).

Claim 17 contains subject matter similar to Claim 9, and thus, is rejected for the same reasons.

With respect to **Claim 20**, Nakatoh in view of Jankowski teaches the VAD method as applied to Claim 1. Although neither Nakatoh nor Jankowski specifically suggests method storage as a computer program on a computer readable medium, it would have been obvious to one of ordinary skill in the art, at the time of invention, to do so in order to increase method

compatibility and usability by providing a means for method use with multiple computer systems.

5. **Claims 5 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatoh et al in view of Jankowski, and in further view of U.S. Patent: 6,263,312 to Kolesnik et al.

With respect to **Claims 5 and 14**, Nakatoh in view of Jankowski teaches the VAD method utilizing windowing as applied to Claim 6. Nakatoh in view of Jankowski does not specifically suggest frame overlapping, however Kolesniket discloses:

The method according to claims 1 and 12 respectively, including overlapping the frames in conjunction with transforming each frame (*transforming samples using a windowing function (Fig. 1A, Element 3), also known as frame overlapping, Col. 5, Lines 1-5*).

Nakatoh, Jankowski, and Kolesnik are analogous art because they are from a similar field of endeavor in audio signal component detection. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the overlapping of frames as recited by Kolesnik with the windowing function as recited by Nakatoh since the method of windowing and overlapping frames are noted by Kolesniket to be the same function.

6. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatoh et al in view of Jankowski, and further in view of Takada (*U.S. Patent: 5,907,624*).

With respect to **Claim 7**, Nakatoh in view of Jankowski teaches the VAD method as applied to Claim 1. Nakatoh in view of Jankowski does not specifically suggest the comparison of speech parameters to a spectral average, however Takada discloses such a method (*frequency*

domain, spectral power) derived from transform products to find if it is greater than a predetermined threshold, Col. 5, Lines 57-64).

Nakatoh, Jankowski, and Takada are analogous art because they are from a similar field of endeavor in signal component detection. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Nakatoh in view of Jankowski with the comparison of speech parameters to a spectral average as taught by Takada in order to provide a more accurate and adaptive voice activity detection by utilizing an average for a threshold comparison, thus implementing a relative signal level comparison.

7. **Claims 10, 11, 18, and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatoh et al in view of Jankowski, and further in view of LaMarche et al (*U.S. Patent: 4,028,496*).

With respect to **Claims 10 and 18**, Nakatoh in view of Jankowski teaches the VAD method as applied to Claim 1. Nakatoh in view of Jankowski does not specifically suggest that a composite signal contains voice and network tone components, however LaMarche discloses:

The signal component is voice in a composite signal containing voice and network tone components (*Col. 4, Lines 35-50*).

Nakatoh, Jankowski, and LaMarche are analogous art because they are from a similar field of endeavor in the detection of speech in the presence of noise. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Nakatoh in view of Jankowski with the ability to detect tone signals in a composite signal

containing tone and voice data as taught by LaMarche in order to prevent confusion of common telephony tone signals with a valid speech signal.

With respect to **Claims 11 and 19**, Nakatoh in view of Jankowski teaches the VAD method as applied to Claim 3. Nakatoh in view of Jankowski does not specifically suggest an additional means of echo detection, however Jankowski discloses such a means (*Col. 7, Line 63-Col. 8, Line 9*).

Nakatoh, Jankowski, and LaMarche are analogous art because they are from a similar field of endeavor in the detection of speech in the presence of noise. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Nakatoh in view of Jankowski with the ability to detect echo signals in a composite signal as taught by LaMarche in order to prevent false speech detection in the presence of echoes.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

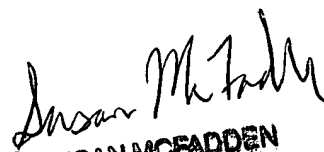
- Liu et al (*U.S. Patent: 6,615,170*)- teaches a method for counting speech and noise tags within a frame to determine the presence of speech.
- Gao et al (*U.S. Patent: 6,581,032*)- teaches a method for counting speech samples under a threshold in a frame to detect noise.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (703) 305-8669 and email is James.Wozniak@uspto.gov. The examiner can normally be reached on Mondays-Fridays, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached at (703) 305-4827. The fax/phone number for the Technology Center 2600 where this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center receptionist whose telephone number is (703) 306-0377.

James S. Wozniak
11/9/2004


SUSAN MCFADDEN
PRIMARY EXAMINER